

103864-200PATENT

(Clean copy)

Claims

1. (Twice Amended) A computer-implemented method of allocating resources including scheduling jobs from among a plurality of resources of a work-producing system, wherein the work-producing system comprises a pharmacy, said method comprising the steps of:

5 (a) sorting, in a predetermined order, available resources by a number of tasks performable, and rate per task, and determining at least one queue responsive to said sorting, wherein the rate per task characterizes the processing of at least one task for a time period, the at least one task including reviewing a pharmaceutical order, filling the pharmaceutical order, and verifying the pharmaceutical order; and

10 (b) assigning the available resources to the at least one task subject to at least one task constraint.

2. A method of allocating resources according to claim 1, further comprising the step of redetermining the at least one queue after assignment of the available resources, and designating the assigned resource unavailable until a predetermined time when the assigned available resources expires.

3. A method of allocating resources according to claim 1, further comprising the step of incrementing time to time of a next event.

WASHINGTON 215101v1

103864-200PATENT

4. A method of allocating resources according to claim 1, wherein the at least one task constraint includes maximum resource capacity, defined start and end times, and scheduled down time.

5. A method of allocating resources according to claim 1, wherein the at least one task constraint includes at least one team assignment constraint, and the available resources are assigned to the at least one task until the at least one team assignment constraint is satisfied.

6. (Amended) A method of allocating resources according to claim 1, wherein said assigning step (b), further comprises the steps of assigning the available resources to the at least one task for a maximum time of task, and removing the at least one task from a resource skill set.

7. A method of allocating resources according to claim 1, wherein the at least one constraint includes an end of shift constraint, and wherein the available resources are not assigned to the at least one task when the assignment violates the end of shift constraint.

8. A method of allocating resources according to claim 1, wherein the predetermined order comprises an ascending order.

[9. (Cancel)]

10. (Amended) A method of allocating resources according to claim 1, wherein said sorting step (a), and said assigning step (b) are performed according to a resource allocation model, and

103864-200PATENT

- wherein the resource allocation model includes entities with variable attributes
- 5 having variable quantities that transform through at least one network of nodes.

11. A method of allocating resources according to claim 10, wherein each node of the at least one network of nodes includes an associated set of attributes and parameters.

12. A method of allocating resources according to claim 11, wherein the attributes are qualitatively defined through at least one of nominal, graphical and symbolic conventions.

cont
B1
13. A method of allocating resources according to claim 12, wherein the available resources include the attributes of the nodes, and the available resources undergo transformational processes arriving at least one arbitrary state or passing through a series of states that may become the attributes of the resources.

14. A method of allocating resources according to claim 11, wherein the parameters are specified as at least one of inputs, outputs, capacities, operational processes, functional behaviors, movement logics, and other dynamic parameters.

15. A method of allocating resources according to claim 10, wherein the resource allocation model stores at least one of historical values, theoretical values, the attributes and constellations of the nodes, and wherein the resource allocation model provides multiple bases of comparison for monitoring, measuring, and evaluating real-
- 5 time operational data and operational performance for management functions.

103864-200PATENT

16. A method of allocating resources according to claim 10, wherein the resource allocation model includes significance and performance criteria, associated tableaux and scenarios, and wherein abstract model elements are stored as at least one of the parameters and the attributes, and as at least one of functional, logical, graphical and
5 symbolic forms.

17. A method of allocating resources according to claim 1, wherein the available resources are characterized by the following information:

- person identifier, person name, person type, shift assignment by day of week, task preference,
- shift name, shift start time, shift end time, lunch start, break 1 start, break
2 start,
- person type categories, eligible tasks,
- task name, rate per task, task capacity, task color for Gantt chart, flow percentages between tasks,
- 10 • projected incoming volume by task and time, and
- start of day queues in each task.

cont 5
B1

103864-200PATENT

18. (Amended) A method of allocating resources according to claim 1, wherein said assigning step (b) assigns the available resources using at least one of the following outputs:

- people allocation: number of people assigned to each task for each time period,
- volume data: number of RX's processed in each task for each time period,
- queue data: queue length for each task area by time period, and
- Gantt chart: person task assignment for each time period.

19. (Amended) A method of allocating resources according to claim 1, wherein said assigning step (b), further comprises the steps of assigning the available resources to a varying set of tasks having varying individual rates.

20. (Amended) A method of allocating resources according to claim 1, wherein said assigning step (b), further comprises the steps of assigning the available resources to the at least one task with a work flow between tasks following a Markov Chain.

21. A method of allocating resources according to claim 3, wherein the next event includes at least one of: a resource or task that becoming subsequently available, incoming work, a queue reaching zero, and a minimum time in the task.

103864-200PATENT

22. (Amended) A method of allocating resources according to claim 1, further comprising the step of repeatedly performing said steps (a) - (b) until the end of a predetermined time period is reached.

23. (Amended) A method of allocating resources according to claim 1, further comprising the step performing the at least one task responsive to the resource assigned in said assigning step (b).

Cont
B1

24. (Cancel).

25. (Cancel)

26. (Cancel)

27. (New) A method of allocating resources according to claim 1, wherein the filling further includes at least one of: vertical fill, baker fill, prepack fill, front fill, narcotics fill, control fill, and insulin syringe fill.

B2

28. (New) A method of allocating resources according to claim 1, wherein the tasks further include at least one of: managed care review, Dr. call verification, eligibility verification, drug utilization review, mail handling, phone refill handling, phone prescription handling, safing, label generation, checking, packing, manifesting, and
5 wandering.

103864-200PATENT

29. (New) A method of allocating resources according to claim 1, further comprising the step of normalizing the at least one queue by dividing a current task queue by an average rate of the available resources for each task in the current task queue.

30. (New) A method of allocating resources according to claim 1, wherein the available resources are assigned to the at least one task and associated with a predetermined queue.

31. (New) A method of allocating resources including scheduling jobs from
5 among a plurality of resources of a pharmacy system, said method comprising the steps of:

cont
B2
10 (a) sorting, in a predetermined order, available resources by a number of tasks performable, and rate per task, and determining at least one queue responsive to said sorting, wherein the rate per task characterizes the processing of at least one task for a time period, the at least one task including reviewing a pharmaceutical order, filling the pharmaceutical order, and verifying the pharmaceutical order;

(b) assigning the available resources to the at least one task subject to at least one task constraint; and assigning the available resources to a varying set of tasks having varying individual rates and variable individual demands, wherein the at least one task is
15 performed at least one of manually and automatically.

32. (New) A method of allocating resources according to claim 31, wherein the available resources are assigned to the at least one task and associated with a predetermined queue.

103864-200PATENT

33. (New) A method of allocating resources according to claim 31, further
5 comprising the step of redetermining the at least one queue after assignment of the
available resources, and designating the assigned resource unavailable until a
predetermined time when the assigned available resources expires.

34. (New) A method of allocating resources according to claim 31, further
comprising the step of incrementing time to time of a next event.

35. (New) A method of allocating resources according to claim 31, wherein
the at least one task constraint includes maximum resource capacity, defined start and end
times, and scheduled down time.

36. (New) A method of allocating resources according to claim 31, wherein
the at least one task constraint includes at least one team assignment constraint, and the
available resources are assigned to the at least one task until the at least one team
assignment constraint is satisfied.

37. (New) A method of allocating resources according to claim 31, wherein
said assigning step (b), further comprises the steps of assigning the available resources to
the at least one task for a maximum time of task, and removing the at least one task from
a resource skill set.

38. (New) A method of allocating resources according to claim 31, wherein
the at least constraint includes an end of shift constraint, and wherein the available
resources are not assigned to the at least one task when the assignment violates the
end of shift constraint.

WASHINGTON 215101v1

103864-200PATENT

39. (New) A method of allocating resources according to claim 31, wherein the predetermined order comprises an ascending order.

40. (New) A method of allocating resources according to claim 32, further comprising the step of normalizing the at least one queue by dividing a current task queue by an average rate of the available resources for each task in the current task queue; wherein the predetermined queue comprises a largest normalized queue.

41. (New) A method of allocating resources according to claim 31, wherein said sorting step (a), and said assigning step (b) are performed according to a resource allocation model, and

wherein the resource allocation model includes entities with variable attributes
5 having variable quantities that transform through at least one network of nodes.

42. (New) A method of allocating resources according to claim 41, wherein each node of the at least one network of nodes includes an associated set of attributes and parameters.

43. (New) A method of allocating resources according to claim 42, wherein the attributes are qualitatively defined through at least one of nominal, graphical and symbolic conventions.

44. (New) A method of allocating resources according to claim 43, wherein the available resources include the attributes of the nodes, and the available resources undergo transformational processes arriving at least one arbitrary state or passing through a series of states that may become the attributes of the resources.

WASHINGTON 215101v1

103864-200PATENT

45. (New) A method of allocating resources according to claim 42, wherein the parameters are specified as at least one of inputs, outputs, capacities, operational processes, functional behaviors, movement logics, and other dynamic parameters.

46. (New) A method of allocating resources according to claim 41, wherein the resource allocation model stores at least one of historical values, theoretical values, the attributes and constellations of the nodes, and wherein the resource allocation model provides multiple bases of comparison for monitoring, measuring, and evaluating real-time operational data and operational performance for management functions.

47. (New) A method of allocating resources according to claim 41, wherein the resource allocation model includes significance and performance criteria, associated tableaus and scenarios, and wherein abstract model elements are stored as at least one of the parameters and the attributes, and as at least one of functional, logical, graphical and symbolic forms.

48. (New) A method of allocating resources according to claim 31, wherein the available resources are characterized by the following information:

- person identifier, person name, person type, shift assignment by day of week, task preference,
- shift name, shift start time, shift end time, lunch start, break 1 start, break 2 start,
- person type categories, eligible tasks,

103864-200PATENT

- task name, rate per task, task capacity, task color for Gantt chart, flow percentages between tasks,

10

- projected incoming volume by task and time, and
- start of day queues in each task.

49. (New) A method of allocating resources according to claim 31, wherein said assigning step (b) assigns the available resources using at least one of the following outputs:

5

- people allocation: number of people assigned to each task for each time period,
- volume data: number of RX's processed in each task for each time period,
- queue data: queue length for each task area by time period, and
- Gantt chart: person task assignment for each time period.

Cont.
B1

50. (New) A method of allocating resources according to claim 31, wherein said assigning step (b), further comprises the steps of assigning the available resources to the at least one task with a work flow between tasks following a Markov Chain.

51. (New) A method of allocating resources according to claim 34, wherein the next event includes at least one of: a resource or task that becoming subsequently available, incoming work, a queue reaching zero, and a minimum time in the task.

103864-200PATENT

52. (New) A method of allocating resources according to claim 31, further comprising the step of repeatedly performing said steps (a) - (b) until the end of a predetermined time period is reached.

53. (New) A method of allocating resources according to claim 31, further comprising the step performing the at least one task responsive to the resource assigned in said assigning step (b).

54. (New) A method of allocating resources according to claim 31, wherein the filling further includes at least one of: vertical fill, baker fill, prepack fill, front fill, narcotics fill, control fill, and insulin syringe fill.

55. (New) A method of allocating resources according to claim 31, wherein the tasks further include at least one of: managed care review, Dr. call verification, eligibility verification, drug utilization review, mail handling, phone refill handling, phone prescription handling, safing, label generation, checking, packing, manifesting,
5 and wandling.

56. (New) A method of allocating resources according to claim 31, further comprising the step of normalizing the at least one queue by dividing a current task queue by an average rate of the available resources for each task in the current task queue.

57. (New) A method of allocating resources according to claim 31, wherein the available resources are assigned to the at least one task and associated with a predetermined queue.

WASHINGTON 215101v1

103864-200PATENT

58. (New) A method of allocating resources including scheduling jobs from
5 among a plurality of resources of a pharmacy system, said method comprising the steps
of:

(a) sorting, in a predetermined order, available resources by a number of tasks
performable, and rate per task, and determining at least one queue responsive to said
sorting, wherein the rate per task characterizes the processing of the task for a time
10 period, the tasks including reviewing a pharmaceutical order, filling the pharmaceutical
order, and verifying the pharmaceutical order;

(b) assigning the available resources to at least one task with a predetermined
queue subject to at least one task constraint; and

(c) dynamically re-allocating the available resources at the end of a real time
15 period, in a same day, for at least one task, including: repeating steps (a) and (b), re-
determining the at least one queue after assignment of the available resources, and
designating the assigned resource as unavailable until a predetermined real time when the
assigned available resource expires.

Cont
B1

59. (New) A method of allocating resources according to claim 58, further
comprising the step of redetermining the at least one queue after assignment of the
available resources, and designating the assigned resource unavailable until a
predetermined time when the assigned available resources expires.

60. (New) A method of allocating resources according to claim 58, further
comprising the step of incrementing time to time of a next event.

103864-200PATENT

61. (New) A method of allocating resources according to claim 58, wherein the at least one task constraint includes maximum resource capacity, defined start and end times, and scheduled down time.

62. (New) A method of allocating resources according to claim 58, wherein the at least one task constraint includes at least one team assignment constraint, and the available resources are assigned to the at least one task until the at least one team assignment constraint is satisfied.

63. (New) A method of allocating resources according to claim 58, wherein said assigning step (b), further comprises the steps of assigning the available resources to the at least one task for a maximum time of task, and removing the at least one task from a resource skill set.

conf
B1
64. (New) A method of allocating resources according to claim 58, wherein the at least constraint includes an end of shift constraint, and wherein the available resources are not assigned to the at least one task when the assignment violates the end of shift constraint.

65. (New) A method of allocating resources according to claim 58, wherein the predetermined order comprises an ascending order.

66. (New) A method of allocating resources according to claim 58, wherein said sorting step (a), and said assigning step (b) are performed according to a resource allocation model, and

103864-200PATENT

- wherein the resource allocation model includes entities with variable attributes
- 5 having variable quantities that transform through at least one network of nodes.

67. (New) A method of allocating resources according to claim 66, wherein each node of the at least one network of nodes includes an associated set of attributes and parameters.

68. (New) A method of allocating resources according to claim 67, wherein the attributes are qualitatively defined through at least one of nominal, graphical and symbolic conventions.

69. (New) A method of allocating resources according to claim 68, wherein the available resources include the attributes of the nodes, and the available resources undergo transformational processes arriving at least one arbitrary state or passing through a series of states that may become the attributes of the resources.

cont
B2
70. (New) A method of allocating resources according to claim 67, wherein the parameters are specified as at least one of inputs, outputs, capacities, operational processes, functional behaviors, movement logics, and other dynamic parameters.

71. (New) A method of allocating resources according to claim 66, wherein the resource allocation model stores at least one of historical values, theoretical values, the attributes and constellations of the nodes, and wherein the resource allocation model provides multiple bases of comparison for monitoring, measuring, and evaluating real-
- 5 time operational data and operational performance for management functions.

103864-200PATENT

72. (New) A method of allocating resources according to claim 66, wherein the resource allocation model includes significance and performance criteria, associated tableaux and scenarios, and wherein abstract model elements are stored as at least one of the parameters and the attributes, and as at least one of functional, logical, graphical and
5 symbolic forms.

73. (New) A method of allocating resources according to claim 58, wherein the available resources are characterized by the following information:

- person identifier, person name, person type, shift assignment by day of week, task preference,
- 5 • shift name, shift start time, shift end time, lunch start, break 1 start, break 2 start,
- B2 • person type categories, eligible tasks,
- task name, rate per task, task capacity, task color for Gantt chart, flow percentages between tasks,
- 10 • projected incoming volume by task and time, and
- start of day queues in each task.

74. (New) A method of allocating resources according to claim 58, wherein said assigning step (b) assigns the available resources using at least one of the following outputs:

103864-200PATENT

5

- people allocation: number of people assigned to each task for each time period,
- volume data: number of RX's processed in each task for each time period,
- queue data: queue length for each task area by time period, and
- Gantt chart: person task assignment for each time period.

75. (New) A method of allocating resources according to claim 58, wherein said assigning step (b), further comprises the steps of assigning the available resources to a varying set of tasks having varying individual rates.

76. (New) A method of allocating resources according to claim 58, wherein said assigning step (b), further comprises the steps of assigning the available resources to the at least one task with a work flow between tasks following a Markov Chain.

77. (New) A method of allocating resources according to claim 60, wherein the next event includes at least one of: a resource or task that becoming subsequently available, incoming work, a queue reaching zero, and a minimum time in the task.

78. (New) A method of allocating resources according to claim 58, further comprising the step of repeatedly performing said steps (a) - (b) until the end of a predetermined time period is reached.

79. (New) A method of allocating resources according to claim 58, further comprising the step performing the at least one task responsive to the resource assigned in said assigning step (b).

103864-200PATENT

80. (New) A method of allocating resources according to claim 58, wherein the filling further includes at least one of: vertical fill, baker fill, prepack fill, front fill, narcotics fill, control fill, and insulin syringe fill.

81. (New) A method of allocating resources according to claim 58, wherein the tasks further include at least one of: managed care review, Dr. call verification, eligibility verification, drug utilization review, mail handling, phone refill handling, phone prescription handling, safing, label generation, checking, packing, manifesting,
5 and wandling.

82. (New) A method of allocating resources according to claim 58, further comprising the step of normalizing the at least one queue by dividing a current task queue by an average rate of the available resources for each task in the current task queue.

B2
83. (New) A method of allocating resources according to claim 58, wherein the available resources are assigned to the at least one task and associated with a predetermined queue.
